

LOOKING BACK ON THE YEAR 2002

The *Reach* editors' picks for the top stories of the year

2002: Meeting Hanford goals, delivering results

For some, it was a budget-crunch year. For almost everyone at Hanford, it was a pick-up-the-pace and do-more-with-less year. It was a year that saw organizations realigned for accelerated cleanup, and a year of leadership changes.

In the year 2002, visible results of cleanup were all around us, more than ever before in the history of Hanford's environmental mission. Milestones were reached early, and under budget. It was a time of great strides in safety, too, and of stepped-up security awareness following the Sept. 11 terrorism of the year before.

Overall, the past year was one of positive change, as reflected in these, the *Hanford Reach* editors' choices of the top stories of 2002.

DOE announced plan to speed site cleanup

Early in the year, the Department of Energy issued a plan for accelerated cleanup. The plan, called the Performance Management Plan for the Accelerated Cleanup of the Hanford Site, was developed by DOE's Office of River Protection and Richland Operations Office and approved by the assistant secretary for Environmental Management, Jessie Roberson.

Working closely with DOE, the U.S. Environmental Protection Agency and the Washington State Department of Ecology played key roles in the initial development and strengthening of the plan's six strategic initiatives. The initiatives, intended as a roadmap for completing DOE's mission at Hanford more than 20 years ahead of the previous schedule, call for the following:

- restoring the Columbia River corridor by 2012
- ending the tank waste program by 2035
- completing stabilization and shipment off site of nuclear materials 10 months early
- speeding the treatment and disposal of mixed low-level waste, as well as retrieval and shipment of transuranic waste off site
- using Hanford's decommissioned chemical separations buildings as waste disposal facilities and accelerating the disposition of the central plateau's 900 excess facilities and more than 800 non-tank-farm waste sites
- isolating contaminant sources on the central plateau to protect groundwater resources.

More information about the Performance Management Plan and performance-based initiatives is available at www.hanford.gov. ■

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2002

Waste Treatment Plant construction began

Building the world's largest vitrification facility on the Hanford Site made news throughout the region, as it did in the pages of the *Hanford Reach*. Two years into a 10-year contract, Bechtel National can point to visible signs that the Waste Treatment Plant complex is taking shape. The multi-billion-dollar plant will immobilize the chemical and radioactive waste now stored in Hanford's 177 underground waste tanks.

Construction in 2002 included work on underground utilities and concrete foundations and basements for both the High-Level Waste and Low-Activity Waste vitrification facilities. Two concrete batch plants were assembled on the site, and the first structural concrete was poured in July. In November, the project received full authorization to proceed with above-ground construction.

An innovative phased approach to permitting by state and federal agencies has allowed foundation work to move forward before the facilities are fully designed. Permits that might have taken years to obtain took just a matter of months. And, in spite of criticism from local businesses, Bechtel pointed to a successful record of local and small-business procurements. More than \$133 million worth of vitrification-plant business has gone to Washington and Oregon companies.

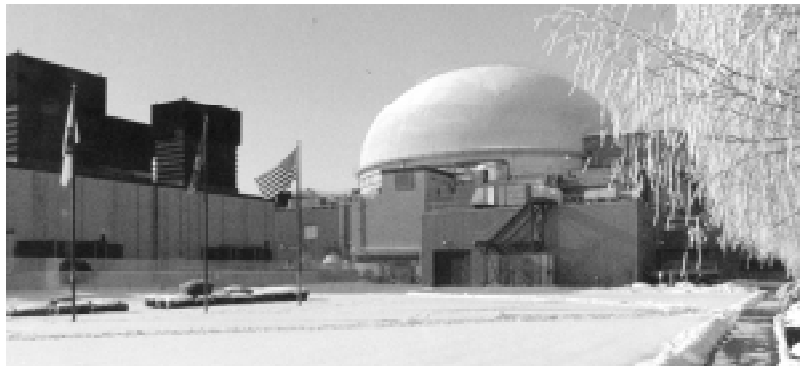
The WTP Project also made news for its safety record, surpassing 7 million work hours without a lost-workday accident. ■

FFTF shutdown remained controversial in 2002

In September 2002, the *Reach* reported that work involving decommissioning and dismantling the Fast Flux Test Facility had been transferred from the Department of Energy Office of Nuclear Energy to the DOE Office of Environmental Management. The action signaled DOE's intent to permanently shut down the reactor, which has been in safe-shutdown mode since 1993.

Draining the coolant system — a step that would make it more costly to restart the reactor — was to begin Nov. 11. But by Nov. 8, Benton County was prepared to file a motion in federal court to halt further dismantlement work at FFTF. In response, the Department of Energy agreed to maintain the reactor's current status until midnight Nov. 22.

Subsequently, Benton County and federal attorneys reached agreement on a briefing schedule for resolution of the case. And DOE agreed that, with certain exceptions, it would suspend until March 12, 2003, any activities that would reasonably be expected to degrade the physical condition of FFTF, including the draining of the reactor coolant systems. The agreement set the stage for all interested parties to have their day in court within the next few months. ■



Some work toward decommissioning and dismantling the Fast Flux Test Facility has been put on hold until next March.

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Spent Nuclear Fuel Project set new records

The Spent Nuclear Fuel Project dramatically increased its rate of fuel removal in 2002 from an average of seven to 17 Multi-Canister Overpacks per month. By year's end, nearly 900 tons of irradiated uranium had been removed from wet storage near the Columbia River and placed in safe, dry storage in central Hanford. This total represents more than 90 percent of the fuel that was stored in the K West Basin when the SNF project began.



Fluor Hanford SNF Project workers ready the first load of fuel from the K East Basin for transfer to the K West Basin for processing.

The project, managed by Fluor Hanford, also reduced the average time needed to load an MCO, transport it to the Cold Vacuum Drying Facility, dry it, transfer it to the Canister Storage Building and place it in below-ground storage. This "process cycle time" dropped from an average of 155 hours per MCO at the beginning of 2002 to 89 hours at year's end.

The Fuel Transfer System began operations in November, ahead of a Tri-Party Agreement milestone, and has transferred about 30 loads of fuel from the K East Basin to K West for processing.

The SNF Project had also cleaned and removed about 1,200 old fuel canisters by the end of the year. And the project accepted all six loads of spent fuel from the 324 Building and the three loads of TRIGA research reactor spent fuel. Seven loads of spent fuel that had been stored for many years at T Plant also were accepted for safe storage.

The SNF Basket Fabrication sub-project completed manufacturing about 2,200 fuel baskets ahead of schedule. The K East Sludge Water System sub-project completed construction, and the entire SNF Project passed its third annual quality assurance audit by the Department of Energy with "effective" ratings in all categories. ■

Plutonium Finishing Plant steps up stabilization

The Plutonium Finishing Plant complex, managed by the Fluor Hanford Nuclear Materials Stabilization Project, nearly reached the halfway point in stabilizing its large collection of special nuclear materials. The project leaped ahead in 2002 by completing stabilization of three major types of materials and starting two new processing campaigns.

Last February, PFP workers completed repackaging about 547 items of plutonium-laced ash from a

Hanford incinerator. The ash was placed into slip-lid cans and packaged into pipe overpack containers through a "pipe-and-go" method. In July, PFP workers finished stabilizing about 4,500 liters of plutonium-bearing solutions using an oxalate precipitation process followed by thermal treatment. The solutions campaign finished ahead of a revised Tri-Party

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PFP steps up stabilization, cont.

Agreement milestone and nearly \$3 million under budget.

Late in the year, the PFP Residues team completed repackaging a small sub-group of residues known as Group 1 Alloys, and a much larger collection known as SS&C (sand, slag and crucible). The SS&C work readied nearly 800 billet cans for permanent disposal at a transuranic waste facility. The SS&C work was completed ahead of schedule, and the team immediately switched to processing a large collection of plutonium oxides and mixed oxide scraps known as "OX/MOX scrap." Project

workers also began stabilizing plutonium-laced polycubes — tiny cubes of polystyrene containing plutonium oxide — and continued the complicated process of "canning" stabilized plutonium oxides into "3013" containers for safe storage.

The project agreed to a challenging new set of performance standards in late 2002, accelerating the completion date for plutonium stabilization to February 2004 and the cleanout and deactivation of nearly 60 structures to September 2006. Expedited deactivation planning and cleanout work surged ahead in 2002. ■

Tank-farm work reduced the risks

New goals for accelerating tank cleanup and closing the tank farm. Tank-farm contractor CH2M HILL Hanford Group pumped record amounts of waste from single-shell tanks to newer, safer double-shell tanks. Transfer piping was installed for delivery of waste to the Waste Treatment Plant, and the Cold Test Facility was completed for demonstrating and developing retrieval methods.

Since 1998, more than 2.7 million gallons of liquid waste have been removed from the older leak-prone tanks, including 200,000 gallons since October. By the end of the year, pumping was under way all the remaining single-shell tanks containing removable liquid.

In May, Congressman Doc Hastings helped dedicate the Cold Test Facility, which includes a large open-top simulated waste tank for cleanup demonstrations using non-hazardous simulated saltcake, sludge and supernatant liquid waste. The facility will increase worker knowledge and safety and reduce the possibility of issues arising when equipment is used for the first time in a real Hanford tank.

Near the end of the year, ORP announced new initiatives for accelerated tank cleanup, including closing 26 to 40 single-shell tanks over the next four years. ■



Tank-farm workers prepare to pump liquid waste from a single-shell tank in October, when the tank-farm contractor reached a significant milestone: 2.5 million gallons of liquid waste had been moved to safer double-shell tanks.

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ER news included cocooning of DR Reactor

A significant Hanford achievement was made by the Environmental Restoration Contractor team in 2002 — the cocooning of another reactor. The news brought Congressman Doc Hastings to the site in November to commemorate the September completion of the cocooning of DR Reactor.

Hanford has seven sites that once housed nine operating plutonium reactors. At five of the reactor sites, only the main reactor building remains. Once each is placed into interim safe storage — or “cocooned” — even the reactor-building footprint is 82 percent smaller. “So, if people want to see cleanup progress at Hanford, the first place they should go is to one of the reactor sites,” said Hastings.

DR, a Cold War-era facility that operated from 1950 to 1964, is the second plutonium production reactor to be cocooned. C Reactor was completed in 1998, and work is under way at D, F and H reactors. The process, which places the old reactors in interim storage for up to 75 years, involves removing all reactor buildings and support structures down to the five-foot-thick shield walls surrounding the core.

“Hanford has made significant progress cleaning up the old reactors and associated cooling-water effluent sites,” said Bechtel Hanford President Mike Hughes. “Work is complete or under way on more than half of Hanford’s nine surplus production reactors. And nearly 40 percent of the contaminated soil has been moved away from the Columbia River.”

Hughes said the cocooning of DR Reactor marks the completion of a major milestone for DOE’s Environmental Restoration Project team. It was completed a year ahead of the scheduled Tri-Party Agreement completion date. ■

Safe work characterized accelerated progress

Projects, contractors and subcontractors were recognized throughout the year for their safety records. The Integrated Safety Management System, the Voluntary Protection Program and worker commitment were repeatedly credited.

The Bechtel National-led Waste Treatment Plant Project surpassed 7 million safe hours by year-end, Lockheed Martin Information Technology became the first subcontractor to reach 5 million hours and the Spent Nuclear Fuel Project surpassed 4 million hours. The Fluor Hanford-managed Waste Management Project reached 4 million safe hours and reduced its injury rates 66 percent in fiscal year 2002 compared to 2001. The Environmental Restoration Contractor team (Bechtel Hanford, CH2M HILL Hanford and Eberline Services Hanford) recorded a million safe hours. And the Nuclear Material Stabilization Project, managed by Fluor Hanford, also worked a million hours safely.

The Foster Wheeler Environmental crew in the 100 N Area had no lost-workday accidents since its project began. The ERC team of BHI, CHI, ESHI and Duratek Federal Services reached six years with no days lost, and nearly two years without an OSHA-recordable injury. The Fluor Hanford-managed Waste Encapsulation and Storage Facility reached a record four years with no days away from work.

The DOE Richland Operations Office and its contractors have made a 16-fold improvement since 1995, when the average time between serious injuries was 260,000 hours. It is now 4 million hours. Workplace injuries are down 67 percent, and the OSHA-recordable case rate has dropped from 4.6 in 1995 to 1.5 currently.

The DOE Voluntary Protection Program has awarded 20 “stars” for safety excellence nationally, and seven of those reside at Hanford, including two bestowed in 2002 (earned by the former River Corridor Project, now the Central Plateau Remediation Project, and by the Volpentest HAMMER Training and Education Center). DOE Headquarters honored the Hanford Site in special ceremonies for these achievements. ■

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Office of Science oversees PNNL research

A change in overseeing agencies, continued innovation and a new supercomputer were a few events that marked the year for the Department of Energy's Pacific Northwest National Laboratory, operated by Battelle.

In July, the DOE Office of Science announced that it would oversee PNNL, which had been the responsibility of the DOE Richland Operations Office.

Energy Secretary Spencer Abraham said, "This new initiative by the Office of Science reflects the President's Management Agenda to reduce bureaucracies, focus on results, streamline functions and make the most of the knowledge, skills and abilities of our people."

Also in July, *R&D Magazine* recognized PNNL researchers and a Battelle subsidiary called OmniViz, Inc. for developing a data mining and visualization software tool called OmniViz, which can be used to analyze and graphically display large collections of numeric, categorical, genomic sequence and text data. The annual competition honors 100 of the most promising new products, processes, materials or software developed throughout the world. PNNL researchers have received 59 R&D 100 Awards since 1969, including 52 since 1988.

The number of U.S. and foreign patents granted for technologies developed at PNNL reached a milestone last summer when the lab's 1,000th patent — for ultrabARRIER substrates (U.S. Patent No. 6,413,645) — was issued. The patented technology contributed to the formation of Vitex, a Battelle spin-off company created to commercialize ultrabARRIER coatings and substrates for flat-panel displays and devices.

PNNL ordered a \$24.5 million Hewlett Packard Linux-based supercomputer that will allow researchers to apply computational science in answering fundamental questions such as how radioactive waste can be processed and stored, and how proteins interact and behave in order to model a living cell. Once it's fully operational in 2003, it should be the world's most powerful Linux-based supercomputer and one of the top supercomputers in the world. The new computer will be installed within the William R. Wiley Environmental Molecular Sciences Laboratory, a DOE scientific user facility at PNNL. ■



Representatives of the City of Richland, the Richland Chamber of Commerce, the Mid-Columbia Symphony and Battelle cut the ribbon to the new Battelle Performing Arts Business Center in Richland. At right is outgoing PNNL director Lura Powell and, next to her, Mindy Strong of PNNL Community Relations. Battelle, operator of PNNL, contributed \$22,000 in 2002 toward the central ticket-selling and meeting center for a dozen performing arts groups.

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